On the Consequences of Scarcity:
When Limited Resources Promote Agentic Responses

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CONTRIBUTION STATEMENT

Scarcity is a fundamental phenomenon that influences consumer behavior. Yet, prior research has largely treated scarcity as a factor that is inherent to a product or commodity, as opposed to a more general factor that may be activated by cues in the environment. The current article advances our understanding of the psychology of scarcity by investigating how exposure to scarcity-related cues activates psychological processes that have downstream implications for judgments and behaviors unrelated to the scarcity that is primed. In particular, it proposes that activating the concept of scarcity causes an underlying shift towards an agentic orientation, which then guides people’s decision making towards advancing their own welfare, relative to that of others. In doing so, the current research offers a more nuanced understanding of why scarcity-related cues may promote different responses in different contexts, by demonstrating that scarcity can lead to increased selfishness or generosity, depending on the associated benefits to the self.

ABSTRACT

Everyday consumers encounter reminders of what is scarce. However, relatively little is known about the psychological processes that result when the concept of scarcity is activated, and further what influence those processes might have on subsequent, unrelated decisions. In this article, the authors posit that activating the concept of scarcity causes an underlying shift towards an agentic orientation. They demonstrate that this agentic orientation guides people’s decision making towards advancing their own welfare, relative to that of others, promoting either increased selfishness or increased generosity, depending on the associated benefits to the self. Overall, this research offers a novel perspective that advances our theoretical understanding of the psychology of scarcity and provides important practical implications.
Scarcity is a pervasive condition that characterizes human existence. Everyday circumstances such as time constraints (Shah, Shafir, and Mullainathan 2011), financial hardships (Sharma and Alter 2012), product shortages (van Herpen, Pieters, and Zeelenberg 2009), and sales promotions (Cialdini 2009) can all induce individuals to experience a sense of scarcity. Yet, despite the ubiquity of the phenomenon, our understanding of the psychological consequences of scarcity is still limited.

In this article, we posit that activating the concept of scarcity causes an underlying shift towards an agentic orientation (Abele and Wojciszke 2007; Bakan 1966; Frimer et al. 2011; Wiggins 1991). We draw from the literature on agency and communion to predict that this agentic orientation will guide people’s decision making towards advancing their own welfare, relative to that of others, thus increasing selfish behaviors (Griskevicius et al. 2009; Hill et al. 2012). At the same time this theoretical framework also predicts that activating the concept of scarcity can cause people to become more generous towards others, in contexts where the associated benefits to the self are highlighted (e.g., charitable giving in order to gain status, Griskevicius, Tybur, and van den Bergh 2010). Overall, this research provides a more nuanced understanding of the psychology of scarcity, and suggests important policy implications regarding how to promote communally-oriented behaviors when resources are lacking.

The remainder of this article is organized as follows. We first present a brief review of prior research relevant to the influence of scarcity on consumer decision making. We then discuss agentic versus communal orientations and introduce our prediction that being primed with scarcity will promote an agentic orientation, which will manifest either in increased selfishness or in increased generosity, as a function of the associated benefits to the self. Next, we test this prediction in five experiments involving both real and hypothetical decisions. We use
a variety of manipulations to activate the concept of scarcity (i.e., listing tasks, episodic recall, and semantic priming) and find robust support for our effect. We conclude with a discussion of the theoretical and practical implications for these findings, as well as suggestions for future research.

THEORETICAL BACKGROUND

Scarcity has been studied across a variety of academic disciplines (Booth 1984), including marketing (Cialdini 2009), psychology (Lynn 1992b), and economics (Lynn 1992a). Previous literature can be read in large part through the lens of commodity theory, as an effort to understand how making a specific object scarce affects its perceived value (Brock 1968). The seminal finding in this area is that a commodity—defined as anything that has usefulness or potential relevance to the needs and interests of the possessor—will be valued more to the extent that it is or becomes unavailable (Brock 1968; Brock and Brannon 1992). This theory has been applied very broadly to products, resources, traits, and skills (Brock and Brannon 1992; Lynn 1991). For example, the fact that reminders of death increase the value of life (King, Hicks, and Abdelkhalik 2009) has been interpreted as supporting commodity theory.

A variety of psychological mechanisms have been purported to explain why commodities become more valuable as their availability decreases (Lynn 1992b). Some argue that this occurs due to a learned association between scarcity and value, described as the “scarcity heuristic” (Ditto and Jemmott 1989). Still others contend it may be a need for uniqueness (Sharma and Alter 2012; Snyder and Fromkin 1980), or psychological reactance aroused from a threat to one’s freedom to obtain the unavailable resource (Brehm 1966) that drive the effect. Overall,
although debate surrounds the process underlying these effects, the existing research converges to suggest that the effect of scarcity on increased valuations is a reliable and robust phenomenon.

Despite its merit, this line of inquiry has focused on just one of the many ways in which scarcity may affect consumer behavior. In particular, it has focused on how making something scarce affects consumers’ behavior with respect to that specific object. In contrast, in the current article, we contend that exposure to scarcity can have systematic carryover effects on decision making even when the content of the decision is entirely unrelated to the scarcity that is primed. Thus, our work aims to extend the existing literature on scarcity, which has largely treated scarcity as a factor that is inherent to a product or commodity, as opposed to a factor that may be generally activated by cues in the environment.

In this research, we examine how activating the concept of scarcity influences consumers’ likelihood of condoning or engaging in selfish behaviors in unrelated domains. Exploring how scarcity influences consumers’ likelihood of condoning or engaging in selfish behaviors is important because divergent predictions can be made based on previous literature. For example, research in the domain of social psychology shows that people with less material wealth and more restricted access to resources tend to be more generous, charitable, and helpful (Kraus et al. 2012; Piff et al. 2010). In contrast, research in evolutionary psychology shows that sustained exposure to resource-scarce environments can increase aggression (Griskevicius et al. 2009) and hostility (Griskevicius et al. 2012a) towards others. Taken together, these divergent findings call for a deeper understanding of how exposure to scarcity-related cues affects one’s likelihood of engaging in selfish actions.

In this research, we argue that when the concept of scarcity is activated, consumers will adopt an agentic orientation, and that this shift in orientation will promote either increased
selfishness or increased generosity, depending on the associated benefits to the self. We draw from literature in different academic disciplines to argue that this shift in orientation occurs because exposure to scarcity-related cues triggers an innate desire to advance or sustain one’s own welfare, a motive that is central to the definition of an agentic orientation.

Scarcity-Related Cues Motivate Competition

In *Leviathan*, Thomas Hobbes states that limited resources, coupled with humans’ selfish nature, result in merciless competition or a constant state of “war of all against all” (1651/1985). This suggestion is supported by research across diverse areas of academic inquiry. As stated previously, research in evolutionary psychology finds that the motive to compete for scarce resources can result in interpersonal aggression (Griskevicius et al. 2009) and hostility (Hill et al. 2012). Work from sociology shows a similar result, demonstrating that the threat of scarcity engenders a decline in social relations with friends and relatives, as well as with more socially distant individuals (Booth 1984). Anthropological research argues this pattern may be even more general, finding, for example, that people living in low-socioeconomic status (SES) neighborhoods are less likely to spontaneously demonstrate altruistic behaviors (e.g., returning a “lost letter” to the intended recipient) than those in high-SES neighborhoods (Holland, Silva, and Mace 2012). This finding is consistent with research in social psychology showing that under time constraints (i.e., when time is scarce) people are less likely to demonstrate helping behaviors (Darley and Batson 1973).

Taken together, these multi-disciplinary findings converge to suggest that activating the concept of scarcity may influence subsequent behavior in unrelated domains in predictable ways.
In particular, they suggest that activating the concept of scarcity may increase selfish or self-focused behaviors. However, no work to date suggests a unifying psychological process that may underlie these observed effects. We draw from research on agentic versus communal orientations to explain these findings and derive our hypotheses.

Scarcity Activates an Agentic Orientation

Agency and communion are two fundamental human motives that govern thinking and behavior (Bakan 1966; Wiggins 1991). Agency arises from strivings to be a differentiated individual and involves such qualities as achievement, power, competence, instrumentality, efficiency in goal attainment, and an independent self-construal. Conversely, communion arises from strivings to integrate the self in a larger social unit through caring for others and involves such qualities as social desirability, morality, nurturance, cooperativeness, benevolence, and an interdependent self-construal (Abele and Wojciszke 2007; Bakan 1966; Frimer et al. 2011; Rucker, Galinsky, and Dubois 2012; Wiggins 1991).

A shift in focus towards one’s own welfare relative to the welfare of others is therefore characteristic of an agentic orientation, whereas a shift in focus towards others’ welfare relative to one’s own is characteristic of a communal orientation (Abele and Wojciszke 2007; Frimer et al. 2011). As a consequence, those with an agentic orientation are more likely to engage in self-profitable behaviors (i.e., behaviors facilitating direct benefits to the self), as compared to those with a communal orientation (Abele and Wojciszke 2007).

Our main proposition is that, when the concept of scarcity is activated, people will be more likely to focus on their own welfare relative to the welfare of others due to an underlying
shift in motivational orientation. Specifically, we argue that when scarcity is primed, consumers will adopt an agentic orientation, and that this shift in orientation will mediate the effect of exposure to scarcity-related cues on one’s likelihood of behaving selfishly versus generously. We argue that this shift in orientation occurs because exposure to scarcity-related cues triggers a fundamental human motive to advance or sustain one’s welfare, which is central to the definition of an agentic orientation (Abele and Wojciszke 2007).

This framework leads to two distinct and important predictions. First, it predicts that exposure to scarcity-related cues should promote strategic responses. Therefore, activating the concept of scarcity should not lead to a generalized, irrational desire to hoard resources. Priming scarcity should increase selfish behavior only when the behavior is directly self-profitable. Second, the framework predicts that priming scarcity can promote behavior that is other-profitable (i.e., the behavior need not exclusively lead to selfish outcomes) under certain conditions. Specifically, priming scarcity will increase generosity when such behaviors are interpreted as offering direct benefits to the self (Abele and Wojciszke 2007; Frimer et al. 2011).

**OVERVIEW OF THE EXPERIMENTS**

We next present five experiments to test our hypotheses. Experiment 1 investigates our proposed main effect, by testing whether activating the concept of scarcity increases individuals’ likelihood of condoning self-profitable behavior. Building on these results, experiment 2 and 3 explore the underlying psychological process, by testing whether being primed with scarcity induces a shift towards an agentic orientation. Experiments 4 and 5 explore relevant boundary conditions that provide convergence on our theory. Specifically, experiment 4 tests whether
consumers’ responses to scarcity-related cues are strategic and adaptive by promoting selfish behavior only when it is directly self-profitable, as opposed to a general desire to hoard resources. Finally, experiment 5 tests whether activating the concept of scarcity can lead to other-profitable behavior when such behavior is framed as offering a direct benefit to the self.

**EXPERIMENT 1: THE EFFECT OF ACTIVATING THE CONCEPT OF SCARCITY ON EVALUATING SELFISH BEHAVIOR**

The goal of experiment 1 was to test for our predicted main effect. Specifically, in experiment 1, we test whether activating the concept of scarcity increases individuals’ willingness to condone a behavior that is self-profitable yet detrimental to others.

Method

Eighty nine undergraduate students (44% male; $M_{\text{age}}=19.0$, $SD=1.143$) participated in a laboratory session in exchange for a small monetary compensation. Participants were randomly assigned to one of two experimental conditions in which the activation of the concept of scarcity (vs. a neutral prime condition) was the manipulated factor. In the scarcity prime condition, participants were sequentially shown five different resources (gasoline, sugar, water, wheat and electricity) and asked to list three things they would not be able to do if those resources were unavailable. In the neutral prime condition, participants were sequentially shown the same five resources and asked to list three things they could do with each resource.
This manipulation allowed us to activate the concept of scarcity while keeping the content of the listing task constant across conditions. A pre-test \((n = 41)\) confirmed that, on average, respondents listed the same activities in both conditions. To illustrate, the top three responses to “sugar” (i.e., sweetening food or drinks, baking or cooking, and enjoying food) represented about 86% of all responses and did not significantly differ between the two conditions \((p’s > .6)\).

After completing the manipulation, participants were asked to evaluate the acceptability of engaging in a socially undesirable but self-profitable behavior. Participants read: “You are supposed to report all of your earned income on your tax statement. However, many people omit additional wages that they earn in their spare time. Is it ok for you to do this?” \((1 =\text{Definitely not ok to } 7 =\text{Definitely ok})\). Tax fraud was chosen as the target behavior for two reasons. First, because it is self-profitable, since it allows one to save money, yet has negative consequences for others, since the omitted taxes decrease social welfare. Second, because it provides a particularly strong test of our predicted effect, as endorsing tax fraud is generally considered socially unacceptable and individuals are very reluctant to admit they think otherwise (Steemkamp, de Jong, and Baumgartner 2009).

Results and Discussion

In line with our prediction, the results show that when the concept of scarcity was activated respondents judged tax fraud to be more acceptable \((M = 4.23; SD = 1.82)\) than when the concept of scarcity was not activated \((M = 3.10; SD = 1.54; F(1, 88) = 4.79; p = .034)\). These findings suggest that priming scarcity can influence subsequent decision making, even when the
content of the decision is entirely unrelated to the scarcity that is primed. In particular, they provide support for the idea that activating the concept of scarcity increases individuals’ willingness to condone a behavior that is self-profitable yet detrimental to others.

In experiment 1, we find that drawing participants’ attention to resource scarcity increased the rate at which they were willing to condone engaging in tax fraud. Building on these results, in experiment 2 we test for a shift in motivational orientation as the psychological process underlying this effect. Moreover, in experiment 2, we ask participants to make a real choice bearing financial consequences, in order to strengthen the external validity of our findings and address the concern that when making consequential decisions, factors relevant to that choice could overwhelm any effects that result from an unrelated priming task (e.g., Simonson 2005).

**EXPERIMENT 2: THE MEDIATING EFFECT OF AN AGENTIC ORIENTATION**

The goal of experiment 2 is to test whether the effect of scarcity on subsequent behavior is due to the activation of an agentic orientation. This was tested using a consequential financial decision – the decision to donate US$1 to charity versus keep the money for oneself. Further, this experiment utilized a different manipulation to activate the concept of scarcity in order to provide convergence.

Method
Forty five undergraduate students (29% male; $M_{age} = 20.0$; $SD = 1.55$) participated in a laboratory session in exchange for a small monetary compensation. Participants were randomly assigned to one of two experimental conditions where the activation of the concept of scarcity (vs. a neutral prime condition) was the manipulated factor.

All participants first completed an episodic recall task adapted from Fischhoff et al. (2003). Specifically, in the scarcity prime condition, participants were asked to describe three or four episodes when they felt like they “didn’t have enough of something” or “resources were scarce.” They were next asked to pick two of the episodes they mentioned and describe each of them in detail, explaining what was lacking and what they experienced. In the neutral prime condition, participants were first asked to think about and write down three or four things that they did during the past week, then to focus on and describe in detail two of these events.

After completing the manipulation, participants were presented with a real donation opportunity. First, they were reminded that they would be compensated US$6 for their participation in the laboratory session. Next, they were offered the opportunity to donate US$1 of their compensation to charity (UNICEF’s Relief Fund for the Children of Sudan’s Darfur). All donations decisions were made anonymously. Finally, participants completed a variety of filler scales, before completing a measure that was aimed to assess the activation of an agentic orientation. This was tested using a 5-item subscale of the Hypercompetitive Attitude Scale (Ryckman et al.1990), which was designed to assess differences in competitiveness tendencies, a key component of an agentic orientation (Abele and Wojciszke 2007; Frimer et al. 2011; Rucker et al. 2012). For this scale, participants indicated their agreement with a variety of statements (e.g., “Competition inspires me to excel” and “If I can disturb my opponent in some way in order to get the edge in competition, I will do so;” scale: 1 = Strongly disagree to 5 = Strongly agree).
None of the items in the scale mentioned or measured attitudes toward retaining or gaining money, thus limiting the likelihood of any unintended direct associations between the proposed mediator and the dependent variable.

Results and Discussion

Results show that participants were significantly more likely to retain the money when the concept of scarcity was activated, as compared to when it was not. Specifically, participants primed with scarcity chose to retain the $1 (i.e., not donate) at a higher rate ($M = 60\%$) than participants in the neutral prime condition ($M = 40\%; \chi^2(1) = 3.75; p = .053$). These results are consistent with the results obtained in experiment 1, and suggest that activating the concept of scarcity increases individuals’ willingness to engage in selfish behaviors.

To test whether activating the concept of scarcity increased respondents’ agentic orientation, we examined their scores on the hypercompetitive attitude subscale (adapted from Ryckman et al. 1990; $\alpha = .72$). The results show that activating the concept of scarcity increased respondents’ agentic orientation ($M = 3.68; SD = .79$) as compared to the neutral prime condition ($M = 3.01; SD = .63; F(1, 44) = 9.66; p = .003$).
To test whether a shift towards an agentic orientation was the mechanism that mediated the effect of activating of the concept of scarcity on self-profitable behavior, we employed a mediation analysis using the bootstrapping technique suggested by Preacher and Hayes (2008). The results based on 5,000 bootstrapped samples indicated that activating the concept of scarcity had a significant positive effect on the agentic orientation measure ($\beta = .66; SE = .21; p < .001$) and that a higher score on this measure had a significant negative effect on the donation rate ($\beta = -1.55; SE = .62; p = .012$). Moreover, while the main effect of activating the concept of scarcity on donation was marginally significant ($\beta = -1.25; SE = .66; p = .058$), the direct effect was not ($\beta = -.43; SE = .78; p = .58$). Because the 95% Bias Corrected confidence interval for the indirect effect did not include 0 (lower 95% CI = -3.54, upper 95% CI = -.14), the mediation was significant (Preacher and Hayes 2008). An agentic orientation therefore fully mediated the relationship between activating the concept of scarcity and selfish behavior.

Having provided preliminary support for our proposed effect and the underlying process, we next seek convergent evidence for a shift in agentic orientation as the process underlying the effects of scarcity on subsequent behavior. Even though agentic and communal orientations are generally considered to be orthogonal, prior research confirms that either an agentic orientation or a communal orientation is typically activated at any time for most people (Fournier et al. 2009; Frimer et al. 2011). This suggests that a prime that increases one’s agentic orientation generally also decreases one’s communal orientation. In order to provide additional support for a shift in agentic orientation as the process underlying the effects observed in experiments 1 and 2, experiment 3 tests if one’s communal orientation decreases when the concept of scarcity is activated.
EXPERIMENT 3: THE EFFECT OF ACTIVATING THE CONCEPT OF SCARCITY ON A COMMUNAL ORIENTATION

The goal of experiment 3 is to further test whether the effect of scarcity on subsequent behavior is due to the activation of an agentic orientation. As previous literature has suggested that a communal orientation is generally less prevalent when an agentic orientation is activated (Fournier et al. 2009; Frimer et al. 2011), we test whether activating the concept of scarcity decreases one’s communal orientation.

Method

Two hundred and sixty four individuals (31.1% male; $M_{\text{age}} = 41.5$, $SD = 14.7$) recruited from Mechanical Turk, a national online participant pool maintained by Amazon.com, participated in a series of experiments in exchange for a small monetary compensation (US$0.50). Participants were randomly assigned to one of two experimental conditions where a scarcity prime (vs. a neutral prime) was the manipulated factor.

All participants first completed a priming task commonly used to activate concepts outside of awareness (Bargh and Chartrand 2000; Wyer and Srull 1989). This task required participants to unscramble nine sentences. In the scarcity prime condition, four of these sentences contained words that were semantically related to scarcity (i.e., scarce, lacking, none, shortage). In the neutral prime condition, participants unscrambled nine neutral sentences containing no scarcity-related words.
After completing the manipulation, participants were administered the Communion Management Scale (Paulhus and Trapnell 2008), which is designed to assess individuals’ communal orientation across a variety of different behaviors. The scale included 20 statements (e.g., “I never drop litter in the street” and “I sometimes drive faster than the speed limit”) and participants were asked to indicate how true each statement was of them (scale: 1=Not true to 7=Very true).

Results and Discussion

A communal score was computed for each participant, following the instructions provided by Paulhus (2006). First, the items that were reversed coded were reversed scored ($\alpha = .85$, across all items). Next, for each item, responses of “6” or “7” were counted as 1 point (all other responses received zero points). Finally, the total amount of points was tallied across all 20 items, hence providing a communal score ranging from 0 to 20.

Results show that priming the concept of scarcity significantly decreased participants’ communal orientation ($M = 5.64; SD = 4.29$) as compared to the neutral prime condition ($M = 6.87; SD = 4.53; F(1, 263) = 5.11; p = .025$). To demonstrate the robustness of our results, we also formed a composite measure of communal orientation by averaging participants’ responses across the 20 items ($\alpha = .85$), then subjected that measure to an analysis of variance test. Using this method, results again show that the scarcity prime significantly decreased participants’ communal orientation ($M = 3.86; SD = 1.02$) as compared to the neutral prime condition ($M = 4.13; SD = .97; F(1, 263) = 4.88; p = .028$). Taken together with the results of experiments 2,
these results provide convergent evidence that activating the concept of scarcity induces a shift in focus towards an agentic orientation and away from a communal orientation.

The final two experiments build on these results by testing for boundary conditions that provide convergence on the process. Experiments 1 and 2 demonstrated that individuals were more likely to retain their money (by not reporting earned income on their taxes or not donating to charity) when the concept of scarcity was activated as compared to a neutral prime condition. This shows that activating the concept of scarcity increases one’s likelihood of condoning or engaging in selfish behavior. However, the data does not specify whether it leads to a strategic response, promoting selfish behavior only when such behavior is self-profitable, or if it promotes a more general selfish orientation. Selfish behavior can be self-profitable and in the service of direct personal gains. However, such behavior may also be selfish with no personal gain attached. For example, greed has been defined as the selfish and excessive desire for more (e.g., money; Wang and Murnighan 2011), and in certain circumstances this desire may be selfish yet not self-profitable (e.g. the diminishing marginal utility of money does not justify greed as a rational strategic behavior). Experiment 4 takes advantage of this distinction in order to test if activating the concept of scarcity promotes selfish behavior only when it is self-profitable, as we predict, or if it promotes a more general selfish orientation.

EXPERIMENT 4: THE EFFECT OF ACTIVATING THE CONCEPT OF SCARCITY ON SELF-PROFITABLE VERSUS SELFISH BEHAVIOR

The goal of experiment 4 is to test whether activating the concept of scarcity leads to selfish behavior very generally, or if, as we predict, if it leads to an increase in selfish behavior
exclusively when such behavior is self-profitable. Experiment 4 tests for this by manipulating whether the concept of scarcity is activated, in addition to manipulating whether retaining one’s resources (i.e., retaining money) is self-profitable versus not adaptive for self-profit. To do so, in experiment 4 participants were asked to play either a dictator or an ultimatum game, in which they were asked to allocate US$10 between themselves and an anonymous other player. Importantly, in the context of the dictator game, retaining a disproportionate amount of money for oneself (i.e., allocating very little to the other player) is self-profitable, since the money retained is unconditionally earned once it has been allocated. In the context of the ultimatum game, however, retaining a disproportionate amount of money can hinder self-profit, because the other player may reject the allocation, which would result in both parties earning nothing (Camerer and Thaler 1995).

Method

One hundred and eighty eight undergraduate students (31% male; $M_{age} = 20.6; SD = 4.58$) participated in a laboratory session in exchange for a small monetary compensation. This experiment used a 2 (prime: scarcity vs. neutral) x 2 (context: ultimatum game vs. dictator game) between-participants design. Following the same procedure as used in experiment 1, participants in the scarcity prime condition were sequentially shown five different resources (gasoline, sugar, water, wheat and electricity) and asked to list three things they would not be able to do if those resources were unavailable. In the neutral prime condition, participants were sequentially shown the same five resources and asked to list three things they could do with each resource.
After completing the manipulation, participants then played either a simulated dictator or ultimatum game. For both tasks, they were asked to imagine that they were about to play a game on the computer with another anonymous individual. The goal of the game was for them to allocate US$10 (in $1 increments) between themselves and the other player. In the dictator game condition, no further instructions were provided. In the ultimatum game condition, participants were informed that the other player would have the opportunity to accept or reject the offer. If the other player accepted the offer, each player would keep the amount of money that had been allocated. If the other player rejected the offer, both players would receive nothing ($0). These instructions were based on standard instructions used in the literature (Camerer and Thaler 1995). All participants used a slider scale anchored at $0 and $10 to indicate the amount of money they were willing to allocate to the other person.

Results and Discussion

We conducted a 2 (prime: scarcity vs. neutral) x 2 (game: ultimatum vs. dictator) analysis of variance to predict the amount of money allocated to the other player. In line with prior work (Camerer and Thaler 1995), the results showed a significant main effect of game-type. Participants allocated more money to the other player when playing an ultimatum game ($M = $4.33; $SD = .20$) as compared to when playing a dictator game ($M = $3.39; $SD = .20$; $F(1, 187) = 10.84; p = .001$). Central to our hypothesis, this main effect was qualified by a significant interaction between the game-type and the scarcity manipulation ($F(1, 187) = 6.56; p = .011$).

Pairwise comparisons revealed that, in the context of the dictator game, activating the concept of scarcity decreased the amount of money participants allocated to the other player ($M$}
= $2.94; SD = .26) as compared to the neutral prime condition (M = $3.83; SD = .30; F(1, 187) =
4.78; p = .03). This pattern replicates the results observed in experiments 1 and 2 by
demonstrating that activating the concept of scarcity promotes selfish behavior. However, in the
context of the ultimatum game, wherein retaining more money can lead to reductions in self-
profit (i.e., earning $0), activating the concept of scarcity did not decrease the amount of money
participants allocated to the other player, and even more, the pattern reversed, even though only
directionally (M_{scarcity} = $4.63; SD = .21; M_{neutral} = $4.04; SD = .27; F(1, 187) = 2.09; p = .15).
No main effect of the scarcity manipulation emerged in the analysis (F(1, 187) < 1).

The results of experiment 4 demonstrate that when the concept of scarcity is activated
people become more likely to retain their money only when doing so is a means to a self-
profitable end. In the context of the dictator game, participants primed with scarcity retained
more money (allocating less to the other player) because doing so was self-profitable. However,
in the context of the ultimatum game, wherein retaining funds can decrease the odds of self-
profit (i.e., the other player can reject the offer), activating the concept of scarcity had no effect
on the amount allocated. These results address an alternate account for the results of experiments
1 and 2 suggesting that activating the concept of scarcity might lead to merely selfish behavior
(e.g., greed or a general desire to hoard resources), as opposed to the strategic pursuit of self-
profit.
Having shown that activating the concept of scarcity promotes self-profitable behavior across four experiments, experiment 5 addresses the important question as to whether there are conditions under which activating the concept of scarcity can promote other-profitable behavior. In doing so, this experiment provides convergence on the underlying psychological mechanism and suggests important policy implications as to how governmental and non-governmental organizations may be able to promote behavior in the interest of the greater good (e.g., pooling resources) even in environments where resources are scarce (e.g., times of economic recession or commodity shortages).

EXPERIMENT 5: WHEN SCARCITY PROMOTES OTHER-PROFITABLE BEHAVIOR

Experiment 5 tests whether activating the concept of scarcity can promote other-profitable behavior. Specifically, we test the proposition that activating the concept of scarcity will increase generosity when such behavior is framed as benefiting the self. We test this hypothesis in the context of gift giving, a behavior that is by definition other-profitable, yet may also be associated with self-benefits (e.g., expected returns). We predict that activating the concept of scarcity will increase gift giving only under conditions when the associated self-benefits are highlighted.

Method
One hundred and forty two undergraduate students (35% male; $M_{age} = 20.9; SD = 1.38$) participated in a laboratory session in exchange for a small monetary compensation. This experiment used a 2 (prime: scarcity vs. neutral) x 2 (self-benefit: not salient vs. salient) between-participants design. Following the same procedure as the one used in experiments 1 and 4, participants in the scarcity prime condition were sequentially shown five different resources (gasoline, sugar, water, wheat and electricity) and asked to list three things they would not be able to do if those resources were unavailable. In the neutral prime condition, participants were sequentially shown the same five resources and asked to list three things they could do with each resource.

After completing the manipulation, all participants read a gift giving scenario. Participants in the self-benefit not salient condition read the following:

Suppose that you are taking a class and you are struggling quite a lot. After getting a bad grade on the first assignment, you ask an acquaintance (who has already successfully passed the class) to help you with the second assignment. S/he agreed to take some time out of her/his busy schedule to help you and, thanks to her/his help, you end up getting a better grade for that assignment. In order to thank the person for helping you, you are thinking of getting her/him a gift.

In the self-benefit salient condition, the following sentence was added at the end of the scenario: “You also think that getting her/him a gift would help convince her/him to help you with your next assignment.”

Participants were then asked to express their likelihood to give a gift (scale: 1 = Very unlikely to 7 = Very likely), what gift they would actually buy (open-ended question), and their
willingness to pay for that gift (in dollars). Likelihood to engage in gift-giving and willingness to pay for the gift were used to form an index of generosity that served as our main dependent variable.

Results and Discussion

We first conducted a 2 (prime: scarcity vs. neutral) x 2 (self-benefit: not mentioned vs. mentioned) analysis of variance to predict gift giving intentions. Consistent with our predictions, the results showed a significant interaction between the scarcity manipulation and the self-benefit manipulation \( (F(1, 141) = 4.39; \ p = .038) \). Pairwise comparisons revealed that, when gift giving was framed as providing a benefit to the self, scarcity-related cues marginally increased participants’ gift giving intentions \( (M = 5.68; \ SD = 1.34) \) as compared to the neutral prime condition \( (M = 5.17; \ SD = 1.38; \ F(1, 141) = 2.841; \ p = .094) \). However, when gift giving did not provide any clear benefit to the self, the scarcity prime did not have an effect on gift giving intentions \( (M_{\text{scarcity}} = 5.03; \ SD = 1.55; \ M_{\text{neutral}} = 5.44; \ SD = .927; \ F(1, 141) = 1.65; \ p > .2) \).

Neither the scarcity manipulation nor the self-benefit manipulation produced significant main effects \( (F's < 1) \).

We then examined willingness to pay for the gift as a function of the scarcity and the self-benefit manipulations. The interaction was marginally significant \( (F(1, 141) = 3.14; \ p = .078) \). Pairwise comparisons revealed that, when gift giving was framed as providing a benefit to the self, scarcity-related cues significantly increased participants’ willingness to pay for the gift \( (M = 12.92; \ SD = 7.74) \) as compared to the neutral prime condition \( (M = 9.40; \ SD = 6.07; \ F(1, 141) = 5.27; \ p = .023) \). However, when gift giving was not framed as benefitting the self,
activating the concept of scarcity had no effect on willingness to pay for the gift ($M_{\text{scarcity}} = 9.85; SD = 6.28; M_{\text{neutral}} = 10.27; SD = 6.01; F(1, 141) = .07; p > .7$). Neither the scarcity manipulation nor the self-benefit manipulation produced significant main effects ($F$'s < 2).

Finally, we standardized the likelihood to engage in gift-giving and willingness to pay in order to be able to average them to create a composite index of generosity ($r(140) = .37; p > .001$). We then conducted a 2 (prime: scarcity vs. neutral) x 2 (self-benefit: not salient vs. salient) analysis of variance to test for the effect of scarcity and self-benefit on generosity. The results showed a significant interaction between the scarcity and self-benefit manipulations ($F(1, 141) = 5.55; p = .02$). Pairwise comparisons revealed that, when gift giving was framed as providing a benefit to the self, scarcity-related cues increased participants’ generosity ($M = .29; SD = .88$) as compared to the neutral prime condition ($M = -.15; SD = .79; F(1, 141) = 5.87; p = .017$). However, when gift giving did not provide any clear benefit to the self, the scarcity manipulation had no effect on generosity ($M_{\text{scarcity}} = -.18; SD = .93; M_{\text{neutral}} = .01; SD = .61; F(1, 138) = .89; p > .3$). Neither the scarcity manipulation nor the self-benefit manipulation produced significant main effects ($F$'s < 1.5).

Taken together, experiments 4 and 5 demonstrate important boundary conditions for the effect of activating the concept of scarcity on subsequent behavior observed in experiments 1 and 2. Experiment 4 demonstrates that it is a focus on self-profitable outcomes, and not merely a
general shift towards selfish motivations (e.g., greed), which drives the pattern of results. Experiment 5 builds on these results by demonstrating that activating the concept of scarcity can in fact promote generosity, such as increasing one’s likelihood of and investment in gift giving, when the associated benefits to the self are highlighted.

These results thus provide a possible explanation as to why under certain conditions individuals lacking resources may be more likely to engage in other-profitable behavior as compared to those whose resources are more abundant (Kraus et al. 2012; Piff et al. 2010). When resources are scarce, people may be dependent on others for valuable commodities (Kraus et al. 2012). As a result, they may behave in a seemingly communal way in order to accrue the maximum self-benefit (Abele & Wojciszke 2007; Frimer et al. 2011).

Interestingly, in experiment 5, we did not observe a main effect of the self-benefit salience manipulation. In other words, participants’ generosity was not affected by whether they could obtain self-benefits (or not) from the act of gift giving in the absence of other factors. This is in line with prior work (Abele & Wojciszke 2007), which suggests that an agentic orientation is more likely to be contextually triggered as opposed to chronically active.

**GENERAL DISCUSSION**

Scarcity is a fundamental phenomenon that influences consumer behavior. Yet, to date our understanding of the psychological processes that scarcity activates has remained limited. The current research provides a novel perspective to shed light on the psychological process that results when people are exposed to scarcity-related cues. Specifically, we show that when the concept of scarcity is activated people are more likely to engage in behaviors that benefit the self
as opposed to others. Our studies demonstrate that when people were exposed to scarcity-related cues, either by priming the concept of scarcity (experiments 1, 3, 4 and 5) or personal experiences involving scarcity (experiment 2), their likelihood of making selfish decisions increased as compared to the neutral prime condition. In support of our proposed process, experiments 2 and 3 demonstrate that a shift towards an agentic orientation underlies the effect of activating the concept of scarcity on selfish decisions. Furthermore, we find that these effects are strategic, in the sense that they are specific to self-profitable selfish behavior and not behavior that is selfish yet not profitable (experiment 4). Finally, experiment 5 illustrates conditions under which activating the concept of scarcity can in fact promote behaviors that are other-profitable, showing support for our theoretical framework.

Our work contributes to the existing literature on scarcity in two important ways. First, the current research adds to the existing literature on scarcity by testing if cognitively activating the concept of scarcity can have carryover effects on subsequent, unrelated decisions. In so doing, we add to prior work that has largely investigated the behavioral consequences of context-specific scarcity (e.g., time constraints: Darley and Batson 1973; Shah et al. 2011; economic or financial constraints: Griskevicius et al. 2012a; Hill et al. 2012; Sharma and Alter 2012; limited availability of potential mates: Durante et al. 2012; Griskevicius et al. 2009, 2012b; limited availability of products: Cialdini 2009; Inman, Peter, and Raghubir 1997; Lynn 1991). We observe that even when the concept of scarcity is activated incidentally (e.g., sentence scrambles) there can be consequences for unrelated decisions (e.g., communal tendencies) due to a shift in motivational orientation. These demonstrations enrich the understanding of the psychology of scarcity by showing that exposure to scarcity-related cues that are context-free and unrelated to a
target decision can effectively instantiate psychological processes with downstream implications for behavior.

Second, we offer a psychological mechanism that provides one potential means for explaining apparently divergent predictions regarding how scarcity-related cues affect social behavior. For example, certain prior research suggests that reminders of resource scarcity may make individuals more selfish (Gрискеvicius et al. 2009; Hill et al. 2012). Yet other research demonstrates that those who have the least to give (i.e., the financially disadvantaged) are often the most generous with others (Kraus et al. 2012; Piff et al. 2010). Our research demonstrates that when the concept of scarcity is activated, people adopt a more agentic orientation. This orientation promotes self-profitable behavior, which will manifest either in increased selfishness or in increased generosity, as a function of the associated benefits to the self. Although further research is necessary to test if an understanding of agentic versus communal orientations can be used to reconcile all of the seemingly contradictory effects of scarcity observed in prior work, we believe the current findings offer a first step towards understanding of why scarcity-related cues may promote different responses in different contexts.

Limitations and Future Research Directions

Despite the robustness of the results presented in this article, which provide convergence on the underlying psychological mechanism, this research has limitations that offer fruitful opportunities for further research. First, across five studies we provided evidence that activating the concept of scarcity increases the tendency to condone and engage in self-profitable behavior. However, it is important to note that in all our experiments, the focal actor was always the self. If
Another limitation is that our studies focused on activating the concept of scarcity through cognitive means. We did so purposefully in order to allow for broad generalizations about how being exposed to scarcity-related cues can affect behavior in different contexts. However, it is important to point out that many common scarcity-related cues contain a visceral component (e.g., hunger, thirst). A question that remains open is whether being exposed to visceral reminders of scarcity also activates an agentic orientation that can lead to carryover effects on unrelated decisions (e.g., financial allocations), or if these more visceral forms of scarcity exclusively promote responses that are reflective of the prime (e.g., food seeking when hunger is activated).

Further, since prior research has established a clear relationship between agentic and communal orientations and independent and interdependent self-construals, such that individuals with an independent self-construal tend to have a more agentic orientation (Abele and Wojciszke, 2007), a logical extension of this work is to test how certain individual differences, such as culture, might affect the observed pattern of results. For example, the current set of studies was conducted in the United States, a country in which people tend to have more of an independent self-construal as compared to other regions (e.g., China; Markus and Kitayama 1991). Because the experience of scarcity is one that is common across the globe, it is important to question if and how cultural differences in self-construal might moderate the observed pattern of results. It is possible that among individuals who are chronically disposed towards a more
interdependent self-construal, it may be more difficult to activate an agentic orientation, hence the same pattern of results may not emerge.

Finally, having observed that activating the concept of scarcity promotes selfish behavior through the activation of an agentic orientation, one might explore the psychological processes that result when cues of abundance are present in the environment. This is particularly interesting to explore because throughout history periods of recession and scarcity have typically alternated with periods of economic expansion and abundance (Chakravarthy and Booth 2004; Griskevicius et al. 2012a). While some research has investigated how being raised in environments of deprivation versus abundance affects choice patterns later in life (Griskevicius et al. 2012a), little is known about how be exposed to abundance-related cues affect decision making.

Practical Implications

We believe the current research suggests important practical implications. First, because exposure to scarcity-related cues promotes an agentic orientation, we argue that retailers should be cautious when utilizing “scarcity marketing” techniques in their promotions (e.g., promotions that emphasize how few items are left or how little time remains to buy them, Cialdini 2009; Inman, Peter, and Raghubir 1997). For example, in the United States many large retailers (e.g., Target, Walmart, Best Buy, among others) offer sales with deep discounts “for one day only” on “Black Friday,” the day following the Thanksgiving holiday. This promotional tactic has been proven effective for retailers (e.g., Black Friday has been the busiest shopping day of the year, prior to the Holiday season, since 2004; ShopperTrak 2011). However, there are associated costs, which may be directly related to the activation of an agentic orientation and the pursuit of self-
profit. Specifically, there have been numerous incidents of violence both against other customers and store employees that have erupted as customers doggedly attempt to garner their share of the limited merchandise (CNN 2011). Our research suggests that the rampant use of scarcity-related cues during such promotions may contribute to these patterns of interpersonal hostility by activating an orientation that focuses the consumer on maximizing personal benefits. By understanding the psychological processes that result when scarcity-related cues are present, retailers may be able to design promotional strategies that maintain the associated benefits while minimizing the interpersonal costs.

Second, these results offer implications to marketers of products that are positioned around pro-social benefits, such as “green” products (i.e., environmentally sustainable goods). Despite the fact that people often express support for pro-social causes, products with pro-social benefits are often unsuccessful in the marketplace (Devinney, Auger, and Eckhardt 2010). We argue that one reason this may be is that such products are often designed to address scarcity-related concerns. To illustrate, hybrid automobiles were designed in part to address concerns about the limited supply of oil. To the extent that these products are associated to scarcity or scarcity-related concerns, it is possible that such items could activate cognitions related to scarcity in the mind of the consumer (Lang, Bradley, and Cuthbert 1998) and, as a result, activate a more agentic orientation. If so, marketing communications that highlight the pro-social benefits of the product (e.g., improved air quality for all) may be less effective than communications emphasizing the personal benefits one can accrue through purchase (e.g., saving money at the pump).

Finally, our results suggest important implications for policy makers designing communications intended to curb self-profitable behaviors that come at the expense of the rest of
society (e.g., tax fraud, experiment 1). More specifically, in contexts where scarcity-related cues are present (e.g., times of recession or commodity shortages) communications should emphasize the self-benefits associated with contributing to the greater good (e.g., paying taxes) in an effort to promote compliance. For instance, paying higher taxes might be framed as a symbol of one’s economic success. The same recommendation extends to contexts where cognitions related to scarcity may be situationally triggered, such as the workplace (e.g., due to time constraints). Here providing personal incentives to reward behaviors such as assisting colleagues or promoting teamwork may be an effective way to help mitigate the negative consequences that could result from excessive self-focus.

In summary, the findings presented here advance our understanding of how being exposed to scarcity-related cues affects one’s psychological orientation and, as a consequence, subsequent behavior. Across five studies, we demonstrate that scarcity activates an agentic orientation, which in turn motivates people to act in a self-profitable manner. Although further research is necessary to fully understand the boundaries of these effects, this research provides an important step towards a better understanding of the psychology of scarcity.
REFERENCES


FIGURE 1
MEDIATION VIA AN AGENTIC ORIENTATION AS A FUNCTION OF SCARCITY ON SELFISH BEHAVIOR, EXPERIMENT 2

Scarcity \rightarrow Competitiveness \rightarrow Donation

Scarcity \rightarrow Donation

\textit{Note.} – * indicates \( p < .1 \); ** indicates \( p < .05 \); *** indicates \( p < .01 \)
FIGURE 2
AMOUNT OF MONEY ALLOCATED TO THE OTHER PLAYER AS A FUNCTION OF
SCARCITY AND TYPE OF GAME PLAYED, EXPERIMENT 4

NOTE.—Error bars indicate +/- 1 standard error
FIGURE 3

GENEROSITY AS A FUNCTION OF SCARCITY AND SELF-BENEFIT, EXPERIMENT 5

NOTE.– The composite generosity index was calculated as the average of standardized likelihood to engage in gift-giving and willingness to pay. Error bars indicate +/- 1 standard error.